CLAIMS

We claim:

1.   (Currently Amended) A method for determining fault sources for device failures, comprising:

generating a failure ~~signatures~~ signature of each of a plurality of fault sources ~~for~~ detected by each of a plurality of preselected tests;

generating an aggregate of failure signatures for ~~individual~~ each of said plurality of fault sources from said failure ~~signatures~~ signature from each of said plurality of preselected tests for a particular fault source;

generating test data for a device for each of said plurality of preselected tests;

generating aggregate device test data from said test data of a device for each of said plurality of preselected tests;

generating aggregate matches by comparing said aggregate of failure signatures for each of said plurality of fault sources with said aggregate device test data; and

determining fault sources for device failures by comparing said test data of said device with ones of said failure signatures of fault sources corresponding to said aggregate matches.

2.   (Currently Amended) The method according to claim 1, wherein said step of generating failure signatures of fault sources for ~~preselected test~~ one of said plurality of preselected tests, comprises:

determining each potential defect ~~failures~~ failure by analyzing a physical layout of said device; and

determining ~~failure signatures~~ a failure signature for each of said plurality of preselected tests corresponding to each said potential defect ~~failures~~ source.

3.   (Currently Amended) The method according to claim 1, wherein said generating said aggregate failure signatures for ~~individual~~ each of said plurality of fault sources from said failure signatures, comprises logically combining failure signatures

corresponding to for each of said plurality of fault source for each of said plurality of preselected tests for individual of said fault sources.

4.   (Currently Amended) The method according to claim 3, wherein said logically combining failure signatures corresponding to said preselected tests for individual of said fault sources, comprises logically OR'ing failure signatures corresponding to each of said plurality of fault source from each of said plurality of preselected tests for individual of said fault sources.

5.   (Currently Amended) The method according to claim 4, wherein said logically OR'ing failure signatures corresponding to said preselected tests for individual of said fault sources, comprises logically OR'ing bitmap patterns defining each of said failure signatures corresponding to each of said plurality of fault source for each of said plurality of preselected tests for individual of said fault sources by centering said bitmap patterns with respect to each other before said logically OR'ing.

6.   (Currently Amended) The method according to claim 1, wherein said generating aggregate device test data from test data of a device for said plurality of preselected tests, comprises logically combining device test data resulting from conducting each of said plurality of preselected tests on said device.

7.   (Currently Amended) The method according to claim 6, wherein said logically combining device test data resulting from conducting said each of said plurality of preselected tests on said device, comprises logically OR'ing said device test data.

8.   (Original) The method according to claim 7, wherein said logically OR'ing said device test data, comprises logically OR'ing bitmap patterns of said device test data.

9.   (Original) The method according to claim 1, wherein said generating aggregate matches by comparing said aggregate failure signatures with said aggregate

device test data, comprises searching said aggregate device test data for <u>each of</u> said aggregate failure signatures.

10.   (Currently Amended) The method according to claim 1, wherein said determining fault sources for device failures by comparing said test data of said device with ones of said failure signatures of fault sources corresponding to said aggregate matches, comprises:

determining a set of fault sources corresponding to <u>each of</u> said aggregate matches;

for individual of said set of fault sources, comparing test data of said device for individual of said preselected tests against failure signatures of said set of fault sources for said individual of said preselected tests; and

determining said fault sources for said device failures by finding matches through said comparing of said test data against said failure signatures.

Claims 11-19   (Cancelled)

20.   (Currently Amended) An apparatus for determining fault sources for device failures, comprising:

means for generating <u>a</u> failure <s>signatures</s> <u>signature</u> of <u>each of a plurality of</u> fault sources <s>for</s> <u>detected by each of a plurality of</u> preselected tests;

means for generating <u>an</u> aggregate <u>of</u> failure signatures for <s>individual</s> <u>each</u> of said <u>plurality of</u> fault sources from said failure <s>signatures</s> <u>signature from each of said plurality of preselected tests for a particular fault source</u>;

<u>means for enerating test data for a device for each of said plurality of preselected tests;</u>

means for generating aggregate device test data from <u>said</u> test data of a device for <u>each of</u> said <u>plurality of</u> preselected tests;

mean for generating aggregate matches by comparing said aggregate <u>of</u> failure signatures <u>for each of said plurality of fault sources</u> with said aggregate device test data; and

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means for determining fault sources for device failures by comparing said test data of said device with ones of said failure signatures of fault sources corresponding to said aggregate matches.